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Multi-layered mode structure of locked-tearing-modes after unlocking[1] MICHIO OKABAYASHI, N. LOGAN, B. TOBIAS, Z. WANG, B. BUDNY, R. NAZIKIAN, PPPL, E. STRAIT, R. LA HAYE, C.J. PAZ-SOLDAN, N. FERRARO, GA, D. SHIRAKI, ORNL, J. HANSON, Columbia U., P. ZANCA, R. PACCAGNELLA, RFX-mod — Prevention of m/n=2/1 tearing modes (TM) by electro-magnetic torque injection has been successful in DIII-D and RFX-mod where plasma conditions and plasma shape are completely different [1]. Understanding the internal structure in the post-unlocked phase is a pre-requisite to its application to reactor relevant plasmas such as in ITER. T_i and toroidal rotation perturbations show there exist several radially different TM layers. However, the phase shift between the applied field and the plasma response is rather small from plasma edge to the q$\sim$3 domain, indicating that a kink-like response prevails. The biggest threat for sustaining an unlocked 2/1 mode is sudden distortion of the rotational profile due to the internal mode reconnection. Possible TM layer structure will be discussed with numerical MHD codes and TRANSP. This work is supported in part by the US Department of Energy under DE-AC02-09CH11466, DE-FG02-99ER54531, DE-SC0003913, and DE-FC02-04ER54698.

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